Screening

NOTE: See chapter 4 in Core Curriculum

Screening:
Guidelines for Screening Foreign-Born Persons

TB cases among foreign-born persons make up about 30 percent of our total number of cases in this state. TB in some countries is much more prevalent than it is in the United States; therefore, persons emigrating from endemic countries will have a higher prevalence of TB infection and disease. Staff at the Section for Communicable Disease Prevention, Disease Investigation Unit have also developed specific recommendations for foreign-born students, foreign-born persons employed at meatpacking facilities, and foreign-born persons that have been in the United States less than five years.

STATEWIDE RECOMMENDATIONS

Foreign-born Students: The Missouri Department of Health & Senior Services has made the following recommendations for the state's university and college campuses as a condition of enrollment:

1. All foreign-born students and faculty should be required to have a Mantoux skin test.
2. All foreign-born students and faculty who are put on TB medications should be directly observed taking their medication through the student health center.

Foreign-born Workers at Meatpacking Facilities: Meat processing plants in Missouri tend to recruit workers from areas of the world considered to be endemic for TB. The Missouri Department of Health & Senior Services recommends a signs and symptoms checklist for tuberculosis every six months on employees and on all new hires. This is a simple, inexpensive and effective screening tool that will help identify any active cases of disease. If anyone should have signs and symptoms, then they should be referred for a chest x-ray and be evaluated by a physician. If a person were then thought to have active disease, then this would trigger the need for skin testing to identify infected contacts.

Foreign-born Persons That Have Been in U.S. Less Than Five Years: Recognizing that recent arrival to the United States from TB-endemic countries is a significant risk factor for the development of TB in foreign-born individuals, the Missouri Advisory Committee for the Elimination of TB (MACET) recommends that these individuals be considered high priority for TB screening and TB infection treatment. Specifically, MACET recommends that foreign-born persons (including students, immigrants, and refugees), notably those from endemic countries*, who have TB infection as evidenced by a positive tuberculin reaction and who have been in the Unites States less than five years, receive TB infection treatment, **regardless of age or BCG vaccination status.**

*Countries with high TB prevalence include those located in Asia, Africa, Latin America, Eastern Europe (including the former Soviet Union and Yugoslavian Republics), the Caribbean and Pacific Islands.

Screening:
Refugee Health Program

POLICY: To screen all incoming refugees for health problems.

PURPOSE: To provide incoming refugees to the State of Missouri with a health assessment designed to eliminate health related barriers to successful resettlement while protecting the health of the Missouri population.

PROCEDURE:

1. A refugee reception and placement form is sent to the Section for Communicable Disease Prevention, Disease Investigation Unit notifying us of the arrival of refugees in the state of Missouri. The unit's refugee clerk types up the Refugee Health Assessment Report (RFG-1) and sends it to the appropriate local health agency or district office. In addition to the RFG-1, a cover letter with an instruction sheet and original quarantine report form will be sent to the LPHA.

2. Once the local health agency has received the Refugee Health Assessment Report form, they should contact the refugee and set up an appointment for the health screening. If the health screening was not completed, Section A of the report form should be completed and the top white copy sent back to the Disease Investigation Unit.

If the refugee was health screened, Sections B through F of the report form should be completed and the top white copy sent back to the Section for Communicable Disease Prevention, Disease Investigation Unit, Refugee Health Program.

Note: Upon entering the United States, all refugees have been instructed to contact the local health agency in the area of resettlement. If the refugee does not contact the local health agency office, the local health agency should initiate contacting the refugee for a health assessment.

3. After the completed white copy of the Refugee Health Assessment Report is returned, the unit's refugee clerk will enter the information into the refugee database.

4. The white and yellow copies of the Refugee Health Assessment Report should be sent back to the Section for Communicable Disease Prevention, Disease Investigation Unit, Refugee Health Program. Also forward any additional information such as new address or city, which the refugee will be relocating.

5. Notice of Arrival of Alien with Tuberculosis: Another form that local health

agencies may encounter is the Notice of Arrival of Alien with Tuberculosis form (CDC 75.17). Sent by the Division of Quarantine of the Centers for Disease Control and Prevention (CDC), this form notifies the state health officer of any alien entering the state who has Class B-1 or Class B-2 Tuberculosis.

Class B-1 - Tuberculosis, clinically active, not infectious.
Class B-2 - Tuberculosis, not clinically active, not infectious.

6. Upon receiving this form from the Centers for Disease Control and Prevention, the Disease Investigation Unit will forward a copy of the Notice of Arrival of Alien with Tuberculosis form and the alien's medical examination report to the appropriate local health agencies.

7. The local health agency should follow the instructions printed on the form and conduct the initial evaluation and complete the form by the specified date on the form. All Notice of Arrival of Alien with Tuberculosis forms should be returned to the Disease Investigation Unit by the specified date. It is the responsibility of the unit to record the information and forward it to the Division of Quarantine, CDC.

   1. **Notice of Arrival of Alien with Tuberculosis Waiver (Class A) (CDC 75.18 Rev. 8/82)** This is a federal form utilized to report aliens who may have active tuberculosis. They will receive medical care from the physician named on the form. That physician has been notified and has agreed to submit a report of the initial evaluation to the local health department. When the local health department receives the evaluation, it should be endorsed and sent to the Section for Communicable Disease Prevention, Disease Investigation Unit as soon as possible. The unit will then forward a copy to the CDC.

   2. **Report on Alien with Tuberculosis Not Considered Active (Class B) (CDC 75.17 Rev. 4/82).** This is a federal form utilized to evaluate aliens and refugees entering the United States with chest x-ray findings consistent with pulmonary tuberculosis. However, the disease is determined **not active** based on medical evaluation and the character of the lesion seen on x-ray. The person may not have received any anti-tuberculosis medications or may have not received an appropriate or effective regimen and is being referred to the local health department for preventive treatment.

      After evaluation, the completed form should be returned to the unit as soon as possible. The Unit will then forward a copy to the CDC.

Screening:
School Employees

For effective tuberculosis control among school employees in Missouri, the following policies are recommended:

A. All personnel, paid and unpaid, who work with children in any capacity shall be certified free from tuberculosis in an infectious form prior to beginning employment. This includes an evaluation THAT indicates no signs or symptoms of infectious tuberculosis disease (persistent cough for >3 weeks, unexplained weight loss, fever, night sweats, general malaise) AND one of the situations described in Sections A.1, A.2, A.3, and A.4 below:

1. An individual who has documentation of a Mantoux PPD tuberculin skin test reading of 0 – 9 mm within the past month, and no history of contact with a person with tuberculosis immediately prior or subsequent to this documentation, shall be considered to be free from tuberculosis. No further skin testing shall be necessary except for epidemiologic or diagnostic purposes which may be required by the local health unit or the Department of Health & Senior Services.

2. If the individual DOES NOT have documentation of a Mantoux PPD tuberculin skin test reading of 0 – 9 mm within the past month and DOES NOT have a history of ever having had a Mantoux PPD tuberculin skin test reading of 10 or more mm, the following procedures shall be followed:

   a. Five tuberculin units (TU) of purified protein derivative (PPD) shall be administered by the Mantoux method and the results read 48-72 hours subsequent to the administration of the test.

   b. If the reading shows an induration of 0 – 4 mm in a person with a recent history of contact with tuberculosis OR an induration of 5 – 9 mm and no history of contact with tuberculosis, he/she shall be considered to be free of tuberculosis.

   c. If the reading shows an induration of 5 – 9 mm and there is a history of contact with tuberculosis OR an induration of 10 or more mm, he/she shall be considered to be a tuberculin reactor and shall be handled as described in Section A.3 below.

3. If the individual is a tuberculin reactor as described in Section A.2.c above OR has a history of a Mantoux PPD tuberculin skin test reading of 10 or more mm without documentation of having received an adequate course of preventive therapy (isoniazid for 6-12 months), the following procedure shall be followed:

a. If the individual has documentation of a normal chest x-ray within the past month, the employee shall be considered to be free from infectious tuberculosis.

b. If the individual does not have documentation of a normal chest x-ray within the past month, a chest x-ray must be obtained as soon as possible within 2 weeks. If the chest x-ray is normal, the employee shall be considered to be free from infectious tuberculosis.

Individuals described in A.3.a or A.3.b above, for whom chest x-rays are normal, shall be considered for preventive therapy (isoniazid for 6-12 months). No further chest x-rays are necessary, unless the employee has symptoms consistent with tuberculosis, as described in the opening paragraph of Section A.

c. Individuals with an abnormal chest x-ray indicating fibrotic lesions or "old" tubercuosis, without documentation of an adequatecourse of chemotherapy, shall be considered for preventive therapy (isoniazid for 12 months or multi-drug therapy for 4 months).

d. Individuals with an abnormal chest x-ray indicating current pulmonary disease (tuberculosis or other) must be thoroughly evaluated and treated accordingly. Such an evaluation must include, but not be limited to collection of sputum specimens (by induction if necessary) for tuberculosis smear and culture. Until infectious tuberculosis is ruled out, the individual should not "share air" with any children, nor with any susceptible adults not already exposed.

4. If the individual has documentation of an adequate course of therapy for tuberculosis disease or adequate infection treatment for tuberculosis infection AND no current pulmonary symptoms, no further chest x-rays are necessary and the employee shall be considered to be free from tuberculosis in an infectious form.

B. The school should consult with the local health department or the Section for Communicable Disease Prevention, Disease Investigation Unit of the Missouri Department of Health & Senior Services for evaluation, management, and surveillance if the individual meets any of the following criteria:

1. Has a history of tuberculosis disease or infection without documentation of adequate treatment as determined by the Unit.

2. Is currently being treated for tuberculosis disease.

3. Has a chest x-ray consistent with pulmonary tuberculosis without documentation of adequate treatment.

4. Has symptoms consistent with tuberculosis.

5. Has a history of contact with tuberculosis within the past 24 months.

Screening:
Long-Term Care Facilities

The control and prevention of tuberculosis in the elderly must be accomplished in order to eliminate tuberculosis as a public health problem.

Many of the elderly were infected with tuberculosis years ago, with the tubercle bacilli dormant most of the time. When the bacilli occasionally became active and began reproducing, the normal immune system quickly overcame the problem. As the body ages, the immune system becomes less active, and other medical problems may develop that further increase the risk of tuberculosis infection becoming active disease. If tuberculosis disease is in the lung, which is the most common site, the person may start coughing and expelling the organisms into the air. This can be especially devastating in a long-term care facility, where many susceptible elderly persons are sharing the same air.

It is therefore important for each facility to have a tuberculosis control program in place. This must include the documentation of the tuberculosis status of each resident, staff member and volunteer of each long-term care facility. This can best be accomplished by screening residents on admission, and pre-employment and annual testing of employees and volunteers as outlined below.

Recommendations for Residents

All residents new to long-term care who do not have documentation of a previous skin test reaction $\geq$10 mm or a history of adequate treatment of tuberculosis infection or disease, should have the initial test of a Mantoux PPD two-step test to rule out tuberculosis within one month prior to or one week after admission. If the initial result is 0-9mm, the second test, which can be given after admission, should be given at least one week and no more than three weeks after the first test. The results of the second test should be used as the baseline. Documentation of a chest x-ray ruling out active pulmonary tuberculosis within one month prior to admission, along with an evaluation to rule out signs and symptoms of tuberculosis, may be acceptable by the facility on an interim basis until the Mantoux PPD two-step test is completed.

The two-step test is recommended due to the "booster phenomenon," which can occur at any age, but is more pronounced with increased age. The body's response to tuberculin (the antigen in PPD), once that response has been established by infection with tuberculosis (or other mycobacteria), may gradually wane over the years. The initial test of two-step test may result in a falsely negative (0 – 9 mm) reading. However, that initial test stimulates the body to respond normally to a subsequent test. This can cause confusion at a later time if the resident is skin tested either as a result of symptoms of tuberculosis disease or as a contact to a newly diagnosed infectious person. The "boosted" skin test then may appear to be the result of new infection,

which puts the individual at much higher risk of progressing to tuberculosis disease. Therefore, it is imperative to purposely elicit this boosted response deliberately in all persons in whom it is important to know their tuberculosis status.

Skin test results of ≥10 mm, whether documented in the resident's medical history, obtained by the first test, or obtained by the second of the two-step test applied by the facility, require a chest x-ray to rule out current tuberculosis disease. It is important to also perform an evaluation to determine if signs or symptoms of tuberculosis (unexplained weight loss, fever, persistent cough) are present. Once tuberculosis disease is ruled out, it is important to record the results of the skin test in millimeters (mm), in a prominent place on the resident's medical record. Including the skin test result at the same place and in the same manner as the resident's allergies is appropriate.

Anyone with tuberculosis infection may progress to infectious tuberculosis disease. Since residents will be sharing air with others who, because of their age and other medical conditions, may be more susceptible to infection with tuberculosis, consideration of a routine course of infection treatment, which kills tubercle bacilli and prevents progression to disease, is recommended. This is especially important in infected persons of any age who have an increased risk of progressing to tuberculosis disease. These include:

a) Persons with skin test reactions ≥5 mm with no symptoms of tuberculosis and no documented history of an adequate course of antituberculosis medications but with fibrotic lesions noted on chest x-ray.

b) Persons with skin test reactions ≥5 mm with HIV infection and those with risk factors associated with HIV infection whose HIV status is unknown. Preventive therapy may be considered for HIV infected persons who have skin test reactions of <5 mm in groups where the prevalence of tuberculosis is high.

c) Close contacts of persons with newly diagnosed infectious tuberculosis who have skin test reactions of ≥5 mm.

d) Recent skin test converters (≥10 mm increase within a 2 year period.) ALL children ≤4 years with a skin test reaction of ≥10 mm are included in this group.

e) Persons with skin test reactions ≥10 mm and the following medical conditions:

1. Diabetes mellitus,
2. Prolonged corticosteroid therapy (>15 mg of Prednisone or equivalent daily for 2-3 weeks),
3. Immunosuppressive therapy,

4. Hematologic and reticuloendothelial diseases (i.e., leukemia or Hodgkin's disease),

5. IV drug users,

6. End stage renal disease,

7. Chronic undernutrition (i.e., intestinal bypass surgery, gastrectomy, chronic ulcer disease, chronic malabsorption syndrome, chronic alcoholism, cancer of the oropharynx and upper gastrointestinal tract).

In addition, even in the absence of any of the above risk factors, the following persons with skin test readings ≥10 mm are recommended for infection treatment:

(1) Foreign-born persons from Latin America, Asia, Africa, Eastern Europe (including Russia and Bosnia), Caribbean and Pacific Islands;

(2) Medically underserved low-income populations, including high-risk racial or ethnic minority populations, especially black, Hispanic, and Native Americans;

(3) Residents, employees and volunteers of long-term care facilities, other health care facilities, schools and child-care facilities.

Annual skin tests for residents with documented results <10 mm are not required, nor are annual chest x-rays for residents with documented skin test results ≥10 mm. Staff persons must be constantly vigilant for signs and symptoms of tuberculosis in residents, and obtain a chest x-ray and sputum specimens should such appear.

Recommendations for Employees

The results of annual tuberculin testing of employees in a long-term care facility are a good indicator of the extent of transmission of tuberculosis within that facility. The following occupationally-exposed persons should be tested at least annually: all employees, attending physicians and dentists, volunteers who spend ≥10 hours weekly in the facility, nursing and allied health personnel, students, instructors and other individuals in regular attendance within long-term care facilities. Every facility should have a tuberculosis surveillance program that includes the following procedures:

1. Initial Examination. Provide a tuberculin skin test (Mantoux, 5 tuberculin units (TU) of purified protein derivative (PPD)) to all employees during pre-employment procedures, unless a previous reaction ≥10 mm is documented. If the initial skin test result is 0 - 9 mm, a second test should be given at least one week and no more than three weeks after

the first test. The results of the second test should be used as the baseline in determining treatment and follow-up of these employees. A history of BCG (bacilli Calmette-Guerin) does not preclude an initial screening test, and a reaction of 10 mm or more should be managed as a tuberculosis infection. A chest x-ray examination should be provided for employees who have a skin test reaction ≥10 mm or who have symptoms compatible with pulmonary tuberculosis in order to determine the presence of current disease.

2. Repeat Tuberculin Skin Tests. It is generally recommended that employees be skin tested on an annual basis as a means of surveillance within a facility. Preventive therapy is recommended for all infected employees, unless specifically contraindicated, to prevent them from developing disease and infecting others. Infected employees who are without disease and who do not complete a course of preventive therapy will need an individualized plan of surveillance. Those who are at high risk of developing disease, i.e. converters, should be assigned where they cannot expose small children, immunocompromised patients, and others for whom the consequences of infection may be especially serious.

3. Repeat Chest X-Ray. After the initial evaluation of persons with skin test reactions ≥10 mm, routine repeated chest x-rays are not recommended. They are neither a substitute for preventive therapy nor vigilance for signs and symptoms of tuberculosis disease. Employees who have completed an adequate course of treatment or preventive treatment should be exempt from further chest x-rays unless they become symptomatic.

4. Reactors with Symptoms of Tuberculosis. All persons with significant reactions to the tuberculin skin test should be instructed to seek medical attention if they have persistent symptoms of tuberculosis.

5. Contact Investigations. When there is an exposure to a suspected or recently diagnosed case of tuberculosis, a contact investigation should be conducted. Each person exposed who previously had a negative reaction to the skin test should receive a tuberculin test. Those who are still negative should be retested three months after exposure. Preventive therapy should be given to high-risk contacts with negative skin tests since they may be infected, even though their skin tests have not yet converted.

   Chest x-rays should be provided for employees whose skin test reactions increase >6 mm from <10 mm to ≥10 mm. Treatment for infection or disease should be provided according to the results of the x-ray.

6. Evaluation. The data generated from this testing should be analyzed periodically to determine and revise policies. The best index of the effectiveness of the program will be the absence of new infections in employees.

Screening:
RECOMMENDATIONS FOR PEDIATRIC SCREENING FOR TUBERCULOSIS

TB is becoming more common in children. The occurrence of TB infection and disease in children provides important information about the spread of TB in homes and communities. When a child has TB infection or disease the following should be kept in mind:

- TB was transmitted relatively recently.
- The person who transmitted TB to the child may still be infectious.
- That other adults and children in the household or community have probably been exposed to TB; if they are infected, they may develop TB disease in the future.

To effectively control tuberculosis among children in Missouri, the following the following policies for screening of children are recommended:

WHO AND WHEN TO TEST	REASON
Children for whom immediate testing is indicated	Contacts of persons with confirmed or suspected infectious tuberculosis (contact investigations); this includes children identified as contacts of family members of associates in jail or prison in the last 5 years. Children with radiographic or clinical findings suggesting tuberculosis. Children emigrating from endemic countries (e.g. Asia, Middle East, African, Latin America). Children with travel histories to endemic countries and/or significant contact with indigenous persons from such countries.
Children who should be tested annually for TB	Children infected with HIV. Incarcerated adolescents.
Children who should be tested every 2-3 years	Children exposed to the following individuals: HIV infected, homeless, residents of nursing homes, institutionalized adolescents or adults, users of illicit drugs, incarcerated adolescents or adults and migrant farm works; this would include foster children with exposure to adults in the above–high risk groups.
Children who should be considered for TB skin testing at ages 4-6 and	Children whose parents immigrated (with unknown tuberculin skin test status) from regions of the world with high prevalence of TB; continued potential exposure by

11-16 years	travel to the endemic areas and/or household contact with persons from endemic areas (with unknown TB skin test status) should be an indication for repeat TB skin testing. Children without specific risk factors who reside in high-prevalence areas; in general, a high risk neighborhood or community does not mean an entire city is at high risk; it is recognized that rates in any area of the city may vary by neighborhood, or even from block to block; physicians should be aware of these patterns in determining the likelihood of exposure; public health officials or local tuberculosis experts should help clinicians identify areas that have appreciable TB rates.

On the following page you will find a one page "TB Screening Worksheet for Pediatric Patients" for your use in screening children for tuberculosis.

Patient's Name: _____ Sex: M F

Address:_____
City County Zip

Telephone:_____ SSN:_____ Birthdate:_____

Risk Factors for immediate testing:

____ Contact to TB case.

____ Abnormal chest x-ray consistent with TB.

____ Clinical findings consistent with TB.

____ Foreign born from endemic country.

____ HIV positive – **Note:** Screen again in 1 year if negative.

____ History of incarceration.

____ Exposed to high-risk adult. **Note:** Screen again in 2-3 years if negative.

- ____ HIV infected
- ____ Homeless
- ____ Nursing home resident
- ____ Institutionalized adult/adolescent
- ____ Illicit drug user
- ____ Incarcerated adult/adolescent
- ____ Migrant farm worker
- ____ Immigrants from endemic countries
- ____ Frequent travel to foreign countries

____ Lives or has lived in high risk neighborhood or community.
Note: Screen again at 4-6 years and 11-16 years if negative.

RESULTS

____ No risk factor for TB, PPD not done. ____ Risk factor for TB, Referred for screening.

Date PPD placed ___/___/___ Date read ___/___/___ Result_____ mm Positive/Negative

Positive: Report to LPHA – Date ___/___/___ contact person _____

Negative: Date of next PPD ___/___/__

MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES
SECTION FOR COMMUNICABLE DISEASE PREVENTION
TB SCREENING WORKSHEET FOR PEDIATRIC PATIENTS

Patient's Name: _____ Sex: M F

Address:_____
City County Zip

Telephone:_____ SSN:_____ Birthdate:_____

Risk Factors for immediate testing:

____ Contact to TB case.

____ Abnormal chest x-ray consistent with TB.

____ Clinical findings consistent with TB.

____ Foreign born from endemic country.

____ HIV positive – **Note:** Screen again in 1 year if negative.

____ History of incarceration.

____ Exposed to high-risk adult. **Note:** Screen again in 2-3 years if negative.

- ____ HIV infected
- ____ Homeless
- ____ Nursing home resident
- ____ Institutionalized adult/adolescent
- ____ Illicit drug user
- ____ Incarcerated adult/adolescent
- ____ Migrant farm worker
- ____ Immigrants from endemic countries
- ____ Frequent travel to foreign countries

____ Lives or has lived in high risk neighborhood or community.
Note: Screen again at 4-6 years and 11-16 years if negative.

RESULTS

____ No risk factor for TB, PPD not done. ____ Risk factor for TB, Referred for screening.

Date PPD placed ___/___/___ Date read ___/___/___ Result_____ mm Positive/Negative

Positive: Report to LPHA – Date ___/___/___ contact person _____

Negative: Date of next PPD ___/___/__